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ABSTRACT

The Costing Standards Committee of the National Association of College and University Business Officers (NACUBO) recently completed an evaluation of the "Cost Analysis Manual" (CAM) and the cost study procedures portion of the "Information Exchange Procedures Manual" (IEP), prepared by the National Center for Higher Education Management Systems (NCHEMS). Evaluation procedures and findings are described in this report and recommended procedural changes are listed. Conclusions: Compared to other costing systems designed for higher education, the CAM and IEP systems are relatively simple and may be particularly adaptable for smaller, single-purpose institutions. The systems are available as a package that can possibly be implemented more easily by some institutions than if they were to develop their own customized costing systems. NACUBO feels that additional research is required for the critical areas that remain unresolved: (1) uses of cost information; (2) fixed, variable, and semivariable costs; (3) cost identification and assignment; (4) modification of CAM and IEP costing systems; and (5) direct and indirect costs. NACUBO and NCHEMS staff are now working together on a project dealing with fixed, variable, and semivariable costs and have agreed to cooperate on resolution of the difficulties of complex institutions in using IEP costing procedures and modification of the existing CAM and IEP costing systems. (JT)

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# NACUBO Special Report 76-2

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Costing Standards

## Evaluation of NCHEMS Costing Procedures

The Costing Standards Committee of the National Association of College and University Business Officers (NACUBO) recently completed an evaluation of the *Cost Analysis Manual (CAM)* and the cost study procedures portion of the *Information Exchange Procedures Manual (IEP)*, prepared by the National Center for Higher Education Management Systems (NCHEMS).

*CAM*, which replaced the manual produced from earlier work of NCHEMS entitled *Cost Finding Procedures*, is a detailed description of a system designed to determine historical full cost for institutions of higher education by aggregating defined components of full cost at the program level. The costing procedures of *IEP* are similar to the costing procedures of *CAM*, but contain modifications intended to provide cost information on a more uniform and comparable basis for exchange among institutions. It should be noted that the cost study procedures portion of *IEP* is only one part of a larger system dealing with exchange of data among institutions of higher education.

The impetus for the evaluation was the growing interest in cost determination, the development of costing procedures by NCHEMS, and the recommendation of the National Commission on the Financing of Postsecondary Education that cost procedures closely parallel to those of *IEP* be used to determine unit cost information. Realizing that the institutions comprising its membership would be looking to NACUBO for leadership in this area, the NACUBO board of directors authorized the Costing Standards Committee to commence with an examination of *CAM* and *IEP* as the initial phase in a long-range research effort in costing in higher education. Staff work for the evaluation project discussed in this report was performed by Peat, Marwick, Mitchell & Co.

### THE EVALUATION PROJECT

The project plan encompassed four tasks, of which three have now been accomplished.

*Task 1.* As a basis for conducting the evaluation, it was necessary for the Costing Standards Committee to codify cost accounting principles applicable to higher education. A result of this task was the publication by NACUBO of a policy document entitled "Fundamental Considerations for Determining Cost Information in Higher Education." For the first time, considerations which represent a foundation for determining cost information in higher education have been documented. These considerations include the purposes of cost information, definitions of cost, cost objectives

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and costing units, types and classifications of cost, relationship of financial accounting and statistical data to costing, cost determination methods and approaches, cost analysis, and costing standards.

*Task 2.* A detailed evaluation of the concepts and procedures embodied in the *CAM* and *IEP* literature was undertaken, which included the following steps:

(1) Identifying the intended uses of *CAM* and *IEP*.

(2) Defining the characteristics of the costing procedures in *CAM* and *IEP*.

(3) Appraising what *CAM* and *IEP* should be used for, based on their characteristics.

(4) Determining whether *CAM* and *IEP*, as presently structured, require modification to meet those uses earlier found to be appropriate to their type of cost analysis.

Results of the review are set forth in two papers: the first, dated May 5, 1975, contains a detailed analysis of each of the major *CAM* principles and procedures, together with observations, conclusions, and twenty-two recommendations for modifications; the second, dated August 18, 1975, summarizes the committee's findings and also presents examples which provide an elaboration on certain key observations.

*Task 3.* Regional groups of NACUBO members reviewed a draft of the document on fundamental considerations and the May 5, 1975, paper. As a result of suggestions received from the participants, revisions were made as appropriate.

*Task 4.* The original plan envisioned a fourth task, review of the *CAM* and *IEP* field test results. This fourth task has been temporarily postponed because implementation of the *CAM* and *IEP* costing procedures is considered by NACUBO to be in the development stage. Based on information received from NCHEMS, it was decided that an insufficient number of institutions had been involved in repeat applications of *CAM* and *IEP* costing procedures to provide two or more consecutive years of cost information results for evaluation. Before a review of field test results is performed, it would be desirable to have a broader and more representative group of institutions included in the field test.

## FINDINGS OF THE EVALUATION

Evaluation of the design of the *CAM* and *IEP* manuals from a theoretical standpoint resulted in the identification of two major categories of problems.

### *Uses of* CAM *and* IEP

The first category pertains to the purposes and uses of cost information. *CAM* indicates as its stated purposes:

(1) Improving internal management capabilities by facilitating the examination of program costs, providing historical parameters to aid in budget preparation, and providing software to assist in the calculation of indirect cost rates.

(2) Facilitating interinstitutional comparisons of cost.

(3) Improving the ability of institutions to prepare reports for external purposes.

Certain, but not all, of the purposes mentioned above can be accomplished by using the costing method and approach employed in the *CAM* and *IEP*, provided certain technical modifications are made to the procedures. This is an important finding which must be carefully considered by all who are interested in cost information pertaining to higher education.

The *CAM* and *IEP* systems utilize the continuous service method and a full costing approach to develop average historical cost for units of service. By aggregating unit costs to the program level, *CAM* and *IEP*, with certain modifications, are useful for examining what the program costs and defined components thereof have been in the past. Being able to make this examination is an important element in the process of evaluating past performance. *CAM* and *IEP* cost information can also be useful in examining the relationship between the historical full cost of a program and the funds that were generated by that program.

Average historical program cost may become a valid basis for developing cost information for purposes of interinstitutional exchange. However, use of cost analysis for this purpose imposes requirements such as uniform application of costing standards and procedures, which are significantly more stringent than those necessary for self-analysis by individual institutions. Cost analysis for exchange purposes must eliminate methodological differences among institutions so that cost comparisons highlight only true functional differences. Equally important is the need to compare program content and benefits. The broader the range of institutions involved in interinstitutional comparisons, the more severe these requirements become. NACUBO feels that the procedures for determining cost information for interinstitutional exchange purposes must take into consideration the inherent differences among institutions such as program, organization, type, and size. Therefore, it may be inappropriate to utilize *CAM* and *IEP* to make interinstitutional comparisons of cost information across the various segments of higher education, e.g., community colleges, four-year colleges, research institutions, etc.

For purposes of providing historical parameters to aid in budget preparation, *CAM* and *IEP* may be useful. However, recognition must be given to the impact of changing conditions, policies, and programs if future costs are to be determined with reasonable accuracy. While *CAM* provides some words of caution in this regard, the reader may be left with the impression that historical cost information is an acceptable substitute for cost information which focuses on the behavior of cost components to determine which elements vary and which remain fixed under a variety of assumptions about program activity levels and mixes. For example, *CAM* and *IEP* alone do not provide information which will answer the question: "If the level of future funding is reduced, what are the alternative choices of programs which would reduce financial requirements accordingly?"

Indirect cost rates used by sponsoring agencies are determined by using one or more sets of cost finding principles or procedures which are established, in part, by governmental agencies. Unless there is a wholesale change in the principles or procedures for determining indirect cost rates, *CAM* and *IEP* procedures are not appropriate for such purposes. Although the computer software developed to support the *CAM* and *IEP* procedures may be useful in making certain of these indirect cost calculations, such software systems were not evaluated.

In terms of improving the ability of institutions to prepare reports for external purposes, *CAM* and *IEP* provide a means of structuring cost information according to a common framework. The intention is that institutions participating in *CAM* and *IEP*

costing procedures would be in a better position to provide requested information to external agencies. However, it should be remembered that the *CAM* and *IEP* systems use the financial accounting records of an institution as their source of financial information in determining costs. Most of the financial reporting requirements of external agencies are currently served by existing accounting systems, and many of the other requirements for information are also being served by existing systems in an institution. Until the uses of full cost per unit of service have been explored in greater depth and tested, it is not known how this type of information can better serve external reporting requirements.

Historically, costing systems have been associated with the management function of cost control. The control function, which involves maintaining supervision over operations, requires costs to be associated with the organizational unit responsible for occurrence of cost, thus requiring a classification which follows the delegation of authority and responsibility. Inherent in the control function are the concepts of cost standards and budgets, which should function as points of reference throughout the operating period. Although not a stated purpose of *CAM* and *IEP*, it should be noted that *CAM* and *IEP* cost information is not useful for cost control purposes. Developing budgets and accounting for costs on this basis require a wholly different type of classification of cost information than is used in *CAM* and *IEP*. Historical cost data may, however, help to identify areas which merit study for possible cost reduction.

Many of the procedures in *CAM* and *IEP* are generally supportable from a theoretical standpoint. However, before *CAM* and *IEP* or any set of costing procedures can be accepted categorically, they must first be put in context in terms of their relationship to the intended purpose and use of cost information and then validated by appropriate testing.

*Recommended Procedural Changes*

The second category of problems that were identified focused on the detailed costing techniques employed by *CAM* and *IEP*. Based on the costing standards and related concepts included in the document on fundamental considerations, certain changes were recommended by NACUBO. If these changes are not properly implemented, *CAM* and *IEP* may be invalid for an intended use. The recommendations are summarized in three groups.

(1) The staff of NCHEMS has agreed that certain changes to *CAM* and *IEP* are appropriate; these are listed below in no special order.

(a) Interest on outstanding debt should be included in full cost.

(b) Guidance should be provided concerning the exclusion from cost of nonmandatory transfers from current unrestricted funds.

(c) Appropriate operating expenses of the central administration of a system of higher education should be included in full cost.

(d) Allowance should be made for variances in depreciation or use charge rates on the useful life of assets.

(e) Provision should be made for other indirect cost allocations which may be as equitable, yet more practical and reasonable.

(f) *IEP* should indicate that costs are to be based on the accrual method of accounting.

(g) Rental expenditures should not be commingled into one activity center entitled "capital cost."

(h) More detailed guidance should be provided concerning the use of costing units.

(i) Provision for doubtful student loans should be included in full cost.

(j) *IEP* should indicate that costs should be reconciled to official records of the institution.

(k) *CAM* and *IEP* should indicate that nonfinancial measures used as costing units should be reconciled to official records of the institution.

(l) *CAM* cost procedures should be expanded to describe the process involved in determining program costs.

(m) A more detailed description should be provided of the difficulties and limitations inherent in the current process of faculty activity reporting.

(n) *CAM* and *IEP* should provide a detailed discussion of how cost information may be used by management.

(o) A discussion should be provided indicating that comparisons among institutions of unit cost information of the Higher Education General Information Survey (HEGIS) disciplines may be misleading unless coupled with a detailed analysis of the purposes and activities of each discipline.

(p) A more precise definition of cost should be provided.

(2) NACUBO and the NCHEMS staff have agreed that additional research is required before principles can be formulated for treating common costs incurred when two or more services are provided in a single process.

(3) The third group of recommended changes have not been entirely resolved with the NCHEMS staff with respect to determination of cost information for *exchange purposes*. These recommendations are all concerned with the definitions and identification of direct cost, and have been accepted by the NCHEMS staff for cost determinations performed for *internal management purposes*. They are:

(a) A distinction should be made between direct and indirect cost within a cost objective.

(b) Recognition should be given to the possibility that the cost of academic department supplies and expenses may be direct rather than indirect.

(c) *CAM* and *IEP* should recommend that nonfaculty compensation be treated as direct cost to the extent that such cost can be related directly to a cost objective.

(d) Reversal of interdepartmental charges, as suggested by *IEP*, should not be undertaken unless they are arbitrary and capricious, except for purposes of comparison of direct cost as defined in *IEP*. Comparison of such "direct cost" may not be meaningful, however, and comparisons of major categories of cost as cited below should be considered.

(e) Inclusion of rental expenditures as capital cost is required for purposes of comparison of direct cost as defined in *IEP*. Comparison of such "direct cost" may not be meaningful, however, and comparisons of major categories of cost as cited below should be considered.

(f) The present definition of direct cost as used in *CAM* and *IEP* should be modified to agree with the generally accepted definition used in cost accounting, and consideration should be given to comparing the major categories of cost described in *CAM* and *IEP* rather than "direct cost."

## CONCLUSIONS

Compared to other costing systems designed for higher education, the *CAM* and *IEP* systems are relatively simple and may be particularly adaptable for smaller, single-purpose institutions. The systems are available as a package that can possibly be implemented more easily by some institutions than if they were to develop their own customized costing systems.

The document that NACUBO published, "Fundamental Considerations for Determining Cost Information in Higher Education," concluded that no single set of cost accounting procedures will satisfy all the purposes for which cost information may be needed. NACUBO feels that considerable additional research is required for the critical areas that remain unresolved:

(1) Uses of cost information: Since so little is known about the appropriate uses of cost information in higher education from the standpoint of empirical testing, a major effort should be an in-depth exploration of such uses. This effort is required in the two broad categories of external uses and internal uses. Once these two objectives have been adequately examined, appropriate procedures may be developed to insure that results of costing efforts are consistent with intended uses. The consideration of external uses must give particular attention to differences among institutions.

(2) Fixed, variable, and semivariable costs: One of the fundamental uses of cost information is perceived to be resource allocation in the planning and budgeting process in a manner which deals quantitatively with changes in volume and mix of services provided. Accordingly, this is an area that needs intensive study as soon as possible. Such a study also needs to consider the many differences that exist among institutions. NACUBO has commenced a study in this area and has invited a member of the NCHEMS staff to participate in the study.

(3) Cost identification and assignment: The identification of faculty time and effort to their various functions and activities continues to be a critical cost determination problem which needs intensive study and resolution. There is a need for more effective procedures for identifying and assigning expended faculty time and effort and related cost. In addition, generally acceptable procedures do not exist for the allocation of costs incurred to provide two or more services simultaneously (joint cost). This problem is in need of extensive study.

(4) Modification of *CAM* and *IEP* costing systems: The potential exists that *CAM* and *IEP* can be modified as set forth in this evaluation, which would permit cost information suitable for certain purposes to be determined. As soon as specific purposes are agreed upon and appropriate modifications are made in the *CAM* and *IEP* costing procedures, utilization of such revised procedures can be undertaken in field testing situations and evaluation of the field tests can be performed.

(5) Direct and indirect costs: Assuming that the interinstitutional exchange of cost and other information is an appropriate and desirable use of such information, NACUBO has recommended modifications to the *IEP* procedures with respect to definition and identification of direct cost. Before these recommendations are accepted by the NCHEMS staff, they have requested that a study be undertaken to determine the effect, if any, on cost data determined under the generally accepted definition of direct cost and the *IEP* definition of direct cost. In the interim, cost information reports for exchange purposes, determined under existing *IEP* procedures, should include the definition of direct cost as used in *IEP* so the readers of such reports will be fully aware of the definition used in the cost determination.

NACUBO and the NCHEMS staff are now working together on a project dealing with fixed, variable, and semivariable costs. In addition, NACUBO and the NCHEMS staff have agreed to cooperate on two other costing activities, namely, (1) resolution of the difficulties of complex institutions in using *IEP* costing procedures and (2) modification of the existing *CAM* and *IEP* costing systems.

It is expected that NACUBO and NCHEMS will seek and find areas in addition to those identified above where their joint efforts can be applied to resolve some of the complex costing problems facing higher education.